CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/CEMENT/2016-17 Date: 08.06.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
*NAME OF THE WORK	:	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
*REFERENCE	:	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
SAMPLE ID	:	Cement – Sample 2
SAMPLE RECEIVED ON	:	04.06.2016
PERIOD OF TESTING	:	04.06.2016 to 08.06.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	30.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	150 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	490 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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VISHWANATH .C
Quality Manager

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/SAND-Gradation/2016-17 : 08.06.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

*** Name of Work** : Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates – Sample 2

Sample Received on : 04.06.2016

Date of Testing : 08.06.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	95.80	90-100	90-100	90-100	95-100
2.36	77.50	60-95	75-100	85-100	95-100
1.18	56.00	30-70	55-90	75-100	90-100
600 Micron	27.50	15-34	35-59	60-79	80-100
300 Micron	15.50	5-20	8-30	12-40	15-50
150 Micron	6.30	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

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Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/AGG/GR/2016-17 : 08.06.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

* **Customer**	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* **Agency**	: **Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
* **Name of Work**	: Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (40mm) - Sample 2
Sample Received on	: 04.06.2016
Date of Testing	: 08.06.2016

Total Wt. of Aggregates in gms= **7000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	98.21	95-100	85-100
20	38.21	30-70	0-20
10	19.86	10-35	0-5
4.75	2.71	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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VISHWANATH .C
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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/AGG/GR/2016-17 : 08.06.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
* Name of Work	: Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
* Reference	: BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (20mm) – Sample 2
Sample Received on	: 04.06.2016
Date of Testing	: 08.06.2016

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS :383-1970 (RA- 2007)	
		Graded	Single Sized
40	100	100	100
20	96.40	95-100	85-100
10	32.40	25-55	0-20
4.75	5.40	0-10	0-5

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits

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Job No.: CTCE/BBMP/W.No.06/RN /STEEL/2016-17 10.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of the Work	:	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
Date of Test	:	10.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	8	0.40	510	552	13.05	O.K	O.K

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Job No.: CTCE/BBMP/W.No.06/RN /STEEL/2016-17 10.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of the Work	:	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
Date of Test	:	10.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	12	0.89	515	558	13.35	O.K	O.K

AE-06
n/a

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Job No.: CTCE/BBMP/W.No.06/RN /STEEL/2016-17 10.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of the Work	:	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
Date of Test	:	10.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	16	1.58	520	563	13.50	O.K	O.K

AE-06 n/a

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/CUBE/2016-17 11.07.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

*** Name of the work** : Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

*** Reference** : BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 11.07.2016

Sl:No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	13.06.2016	11.07.2016	8.125	480.5	21.36
2	13.06.2016	11.07.2016	8.238	495.3	22.01
3	13.06.2016	11.07.2016	8.315	503.6	22.38

AE-06 n/a

* Information is furnished by the Customer/Representative

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Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057m/CUBE/2016-17 13.07.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

*** Name of the work** : Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

*** Reference** : BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 13.07.2016

Sl:No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	15.06.2016	13.07.2016	8.188	489.6	21.76
2	15.06.2016	13.07.2016	8.289	510.2	22.68
3	15.06.2016	13.07.2016	8.325	516.3	22.95

AE-06 n/a

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Job No.: CTCE/BBMP/W.No.06/RN/WMM/Gradation/2016-17 12.07.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

Agency : **Mr. R. Nithin,**
No.58, Muneshwara Layout, 5th cross, Bangalore - 91.

Name of Work : Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016

Date of Testing : 12.07.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **8130**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	150	150	1.8	98.2	95-100
22.4	2450	2600	32.0	68.0	60-80
11.2	1310	3910	48.1	51.9	40-60
4.75	1085	4995	61.4	38.6	25-40
2.36	1020	6015	74.0	26.0	15-30
0.600	980	6995	86.0	14.0	8-22
0.075	855	7850	96.6	3.4	0-8

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Job No.: CTCE/BBMP/W.No.06/RN/WMM/AIV/2016-17 12.07.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of the Work	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	12.07.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	303	
4	Aggregate Impact value = percent fines	20.58	20.68	
	100* (W_2/W_1)%			**20.63**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.06/RN/WMM/S-T/2016-17 12.07.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
Name of Work	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	12.07.2016

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.58%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index 25.83%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

AE-ok n/a

Note:

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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.06/RN/CSR-06/057M/QB/2016-17 18.07.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
*NAME OF THE WORK	:	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	16.07.2016
DATE OF TESTING	:	18.07.2016

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	82	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	46	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	298	Min. 220

*Information is furnished by the Customer/Representative.

AE-06 n/a

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VISHWANATH .C
Quality Manager

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Job No.: CTCE/BBMP/W.No.06/RN/SDBC/Bit/2016-17 21.07.2016

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
NAME OF THE WORK	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
SAMPLE I/D	Roads on LHS of Maruthi Layout in ward No.06, BBMP, Bangalore.
DATE OF TESTING	21.07.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	473.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.50
7. Bitumen content in %	5.00	5.30
8. Average	**5.15**	

AE-06 n/a

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Job No.: CTCE/BBMP/W.No.06/RN/SDBC/Bit/2016-17 21.07.2016

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. R. Nithin,** No.58, Muneshwara Layout, 5th cross, Bangalore - 91.
NAME OF THE WORK	Improvements to Roads and Drains at Left hand side of Maruthi Layout in Ward No.06 Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/08/2016-17 Dated: 30.04.2016
SAMPLE I/D	Roads on LHS of Maruthi Layout in ward No.06, BBMP, Bangalore.
DATE OF TESTING	21.07.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	24.36	5.13	5.13	94.87	90-100
4.75	262.5	55.26	60.39	39.61	35-51
2.36	56.36	11.87	72.26	27.74	24-39
1.18	41.25	8.68	80.94	19.06	15-30
0.3	33.26	7.00	87.94	12.06	9-19
0.075	30.28	6.37	94.32	5.68	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.15	5.31	5.31	94.69	90-100
4.75	265.3	56.03	61.34	38.66	35-51
2.36	35.26	7.45	68.79	31.21	24-39
1.18	33.12	6.99	75.78	24.22	15-30
0.3	42.25	8.92	84.71	15.29	9-19
0.075	43.15	9.11	93.82	6.18	3-8

AE-05 n/a

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